

REMARKS

The present amendment is in response to the Office Action, dated November 13, 2002, where the Examiner has *finally rejected* claims 3, 4, 9 and 12-14 pending in the application. By the present amendment, claims 3, 4, 9 and 12 have been amended. Accordingly, claims 3, 4, 9 and 12-14 are pending in the application. Reconsideration and allowance of pending claims 3, 4, 9 and 12-14 in view of the amendments and the following remarks are respectfully requested.

A. Rejection of Claims 3, 4, 9 and 12-14 Under 35 USC § 103(a)

The Examiner has rejected claims 3, 4, 9 and 12-14 under 35 USC § 103(a) as being unpatentable over Pio et al. (USPN 5,894,146) (“Pio ‘146”) in view of Peng (USPN 5,851,886) (“Peng ‘886”). Applicant respectfully disagrees; however, in order to expedite the prosecution of this application, applicant has amended independent claims 3 and 9 to further specify that “a dopant concentration region is displaced about a target region” wherein “said target region is situated below said channel region” and wherein “said dopant concentration region extends into said channel region such that said channel region has a non-uniform concentration of dopant.” For the reasons that follow, applicant submits that amended independent claims 3 and 9 are patentably distinguishable over the cited art of record, considered either solely or in combination.

The Examiner acknowledges that Pio ‘146 fails to disclose a non-uniform concentration of dopant as recited in claims 3 and 9 (Pages 2 and 4 of the Detailed Action). However, the Examiner cites Peng ‘886 stating that Peng ‘886 discloses “a channel region (170) separating the source and drain regions and having a non-uniform concentration of dopant” (Page 2 of the Detailed Action). Neither Pio ‘146 nor Peng ‘886, however, discloses or suggests a “dopant concentration region displaced about a target region” where the “target region is situated below said channel region” and where the “dopant concentration region extends into the channel region

such that the channel region has a non-uniform concentration of dopant,” as specified in claims 3 and 9.

For example, Peng ‘886 merely relates to a channel region formation process, where ions are implanted in the channel region to form the channel region 170 (see, e.g., Abstract and Col. 3:40-54). In contrast, claims 3 and 9 specify a “dopant concentration region displaced about a target region” where the “target region is situated below said channel region.” That is, the dopant concentration region is distinct from the channel region itself. As specified in claims 3 and 9, the dopant concentration region extends into the channel region such that the channel region has a non-uniform concentration of dopant.

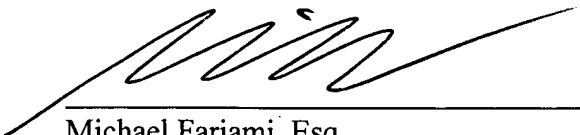
Applicant respectfully submits that the dopant concentration region structure as specified in claims 3 and 9 is neither disclosed nor remotely suggested by Pio’146 and Peng ‘886, considered either solely or in combination. Accordingly, applicant respectfully submits that the rejection of independent claims 3, and its corresponding dependent claim 4, and independent claim 9 and its corresponding dependent claims 12-14, has been traversed and that, therefore, claims 3, 4, 9 and 12-14 should now be allowed.

B. Conclusion

For all the foregoing reasons, allowance of claims 3, 4, 9 and 12-14 pending in the present application is respectfully requested.

Respectfully Submitted;
FARJAMI & FARJAMI LLP

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Michael Farjami, Esq.
Reg. No. 38,135

Michael Farjami, Esq.
FARJAMI & FARJAMI LLP
16148 Sand Canyon
Irvine, California 92618
Tel: (949) 784-4600
Fax: (949) 784-4601

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 3, 4, 9 and 12 have been amended as follows:

3. (Twice Amended) A memory array comprising:

a plurality of floating gate transistors connected in series,

each floating gate transistor having formed, in a well of a substrate,

a source and a drain region

and

a channel region separating said source and drain regions,

a dopant concentration region displaced about a target region, said target region situated below said channel region, said dopant concentration region extending into said channel region such that said channel region having has a non-uniform concentration of dopant;

~~— wherein said non-uniform concentration comprises a retrograde concentration distribution in the direction from the surface of the substrate,~~

~~— and wherein said non-uniform concentration comprises a lateral concentration distribution along the length of the channel that is higher in a region generally towards the central portion of the channel and decreases toward the opposing source and drain regions.~~

4. (Twice Amended) The memory array of claim 3 wherein ~~the non-uniform concentration~~ said dopant concentration region is formed by a tilted ion implantation utilizing as a mask, at least a part of a gate structure of each floating gate transistor.

9. (Twice Amended) A transistor comprising:

in a well structure of a substrate, a source and a drain region and a channel region separating the said source and the said regions, a dopant concentration region displaced about a target region, said target region situated below said channel region, said dopant concentration region extending into said channel region such that said channel region having has a non-uniform concentration of dopant;

~~wherein said non-uniform concentration comprises a retrograde concentration distribution in the direction away from the surface of the substrate;~~

~~——— and wherein said non-uniform concentration comprises a lateral concentration distribution along the length of the channel that is higher in a region generally towards the central portion of the channel and decreases toward the opposing source and drain regions.~~

12. (Once Amended) The transistor of claim 9 wherein

said ~~non-uniform concentration~~ dopant concentration region is provided by a tilted ion implantation utilizing as a mask, at least part of a gate structure of said transistor.